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CONTRACEPTION

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UWO MEDICAL JOURNAL

VOL. 35: NO. 1, DECEMBER, 1964

UNIVERSITY OF WESTERN ONTARIO

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CONTRIBUTIONS will be accepted with the understanding that they are made solely to this publication. Articles should be of practical value to students and medical practitioners. Original research work is most welcome. Articles should not be longer than 3,000 words, and we will more readily accept those of shorter length. Introduction and summary of conclusions should be included. Drawings and photographs will be accepted, the former to be in black ink and drawn clearly.

All articles submitted *must be typewritten,* on one side of paper only, with double spacing and one and one-half inch margins on each side. Canadian Press (American) spelling must be adhered to. The format for references is as follows: *For books*: Author(s): *title of book,* publisher, place, year. *For journals*: Author(s): *title of article,* name of journal (abbreviated as in the World List of Scientific Periodicals), volume: page, year.

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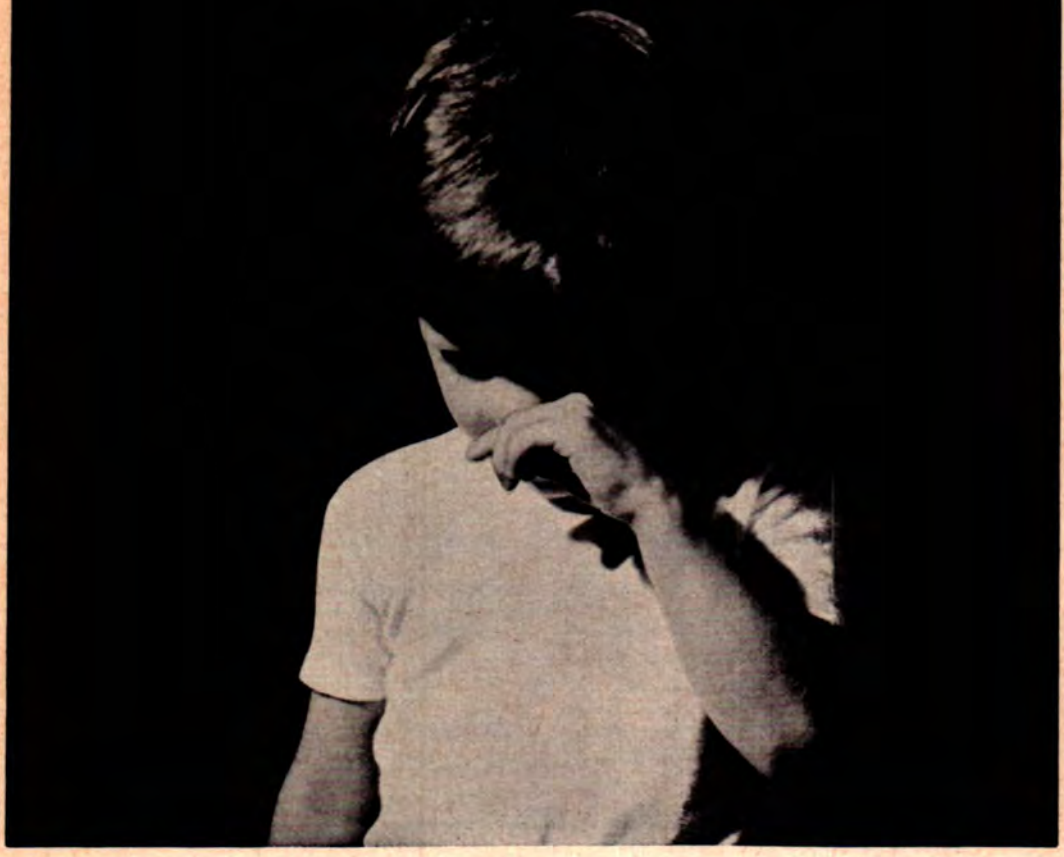

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Editorial

Should contraception be banned or promoted?

The Expert Committee on Maternity Care of the World Health Organization has stated:

"In areas in which some degree of family limitation is considered desirable because of population policies, or because the well-being of the mother and the child is being affected by excessive child-bearing, or because of social or economic reasons, the giving of appropriate advice should be included in maternity-care programmes."

However, it is known that certain religions do not permit the use of such devices. These two points of view serve as examples of the controversy regarding the subject of Contraception.

As the practitioners of the future, medical students of to-day must be firm in their views regarding contraception. Each must be aware of his moral obligations as well as the medical and legal aspects of contraception.

It is the purpose of this issue to acquaint medical students and practitioners with the facts regarding contraception. Are you aware of the legal and historical aspects of contraception? These topics are discussed in this issue.

Over the years many methods have been devised in an attempt to control procreation. Opinions regarding the use of such devices are based on many factors including religion, medical facts and the Law. Having considered all facets of the problem, everyone must come to his own conclusion. Your comments and opinions will be welcomed in the form of a letter to the Editor.

The wide scope of such a subject necessitates limiting the amount of Alumni news to be included in this issue. However, more news of graduate classes will appear in subsequent issues of the Medical Journal.

D. M. W.

Contraception
Social and Medical Views

JERALD BAIN, B.Sc Phm., '65

Every day thousands of Canadians flagrantly break the laws of this country by indulging in the sexual act with the aid of one of the several contraceptive agents in widespread use to-day. The questions we intend to raise and suggest answers for in this article are: should the laws of Canada be changed?, should, in fact, contraceptive literature and information be readily available to whomsoever desires it?, should government and public agencies openly encourage contraception?, should physicians be given the legal right to advise about and prescribe contraceptives where he deems necessary, or where his patients request it?, should the side of contraceptives be made legal?, and should the medical student's education with respect to contraception be more encompassing so that he will be better equipped with what is understood to be his responsibility to the public?

As we know, the question of contraception is one which evokes a great deal of emotionalism and sensationalism and brings into the sphere of discussion the medical, ethical, religious and moral outlook on this very touchy subject. It is obvious then, that to be totally objective, one must be scientific, which means the facts must be clearly presented and superstition and conjecture must be dispensed with. We must rely on responsible and reliable data coupled with simple logic.

It is generally agreed that man is constantly striving for an unfettered freedom, for a liberty that frees him not only from his own restrictions but that frees him from the restrictions imposed upon him by those around. Man yearns to be free and any attempt to put his body or his mind in chains is doomed only to failure. We will submit that laws to protect the community as a whole must be maintained, but that the individual man must be at liberty to make his own decisions with regard to how he shall conduct his own life. Freedom is the essence of existence and this author maintains that just as we deem freedom of speech a basic right, so must each human have the right to decide for himself whether he wants one, two, three or twelve children, and when he wants them, or whether he wants them at all. No dogma or authority must be imposed upon an individual or a nation if that individual or nation wish to reject that authority, provided that the rest of society is not injured in any way.

It is sufficient to rest the case for contraception solely on the argument that it is the individual's inalienable right to choose for himself, and not have a government decree dictate what it thinks is the proper course of action for that individual. But this is a revolutionary concept in our country to-day and superstition still forces many of us to reject the above simple logic. In the ensuing paragraphs I will present further arguments and even specific indications for contraception in our quest for a more liberal attitude toward the all-important question of birth-control.

It has been argued that the prime purpose of sexual intercourse between a married husband and his wife is for procreation. Others argue that is it the highest expression of love that man and wife can bestow upon one another. These statements are pure and simple conjecture and there is no authoritative source that tells us intercourse is primarily for procreation or primarily for love. Sigmund Freud may simply have said that intercourse is for the pleasure of

the individual pure and simple, and all other considerations such as children or the pleasure of the partner are secondary. Whether we will acknowledge it or not, the act of sexual intercourse as a source of human pleasure is most assuredly a distinct entity from the act of sexual intercourse whose outcome is not only pleasure but the reproduction of the species. It is an anthropological fact that in the early days of human history, sexual intercourse was practised without its relationship to baby production being known. It was only an incidental discovery that sometimes women became pregnant after having indulged in sexual intercourse; therefore, humans entered the sex act with no thought of possible conception but rather because it was a pleasurable experience.

Even to-day, some Australian tribes do not believe in the relationship between intercourse and reproduction, indicating that the sex act has no reproductive meaning to them whatsoever.[1]

Surely everyone must agree that the birth of children into this beautiful world of ours must not be a reckless, haphazard event? The way should be paved for not only the proper mental attitude on the part of the parents in conceiving the child, but also, once the child is born, the atmosphere should be one that is conducive to its mental and physical well-being. Margaret Sanger, one of the founders of the American Birth Control League, has indicated that children should be:

(a) conceived in love,

(b) born of the mother's conscious desire,

(c) only begotten under conditions which render possible the heritage of health.[2]

One of the prime considerations in any discussion advocating wider birth control propaganda and usage is the all-important question of the "world population explosion". This is not just an idle phrase but a real threat to the future of the human race. It is the aim of all nations to produce a better standard of living which means sufficient food supplies, good health, literacy, education and gainful employment. All of these traditional human aspirations are being seriously threatened by the barrier of overpopulation in the world. At the present rate of growth, the world population will double in 35 years (i.e. will be about six billion by the year 2000), will be twelve billion in 70 years, and twenty-five billion by 2070. This growth is out of proportion to present and prospective rates of increase in economic development.[3]

The same study that provided the above statistics concluded that voluntary planning and control of family size can and will provide better opportunities for all children and greater happiness for their parents.

Next to abstinence, which is certainly a most unnatural condition psychologically and physiologically, contraception is the easiest and most convenient means of keeping the world population in check. Some undesirable ways of keeping the birth rate down could then be done away with. Some of these include:

1. No marriage — This, of course, implies abstinence which again would mean the ultimate destruction of the human race.

2. Late marriage — The dangers to both mother and fetus when conceived late in life are well known.

3. Infanticide — Some tribes even to-day, it is claimed, resort to this barbaric custom of killing unwanted new-born children. The use of contraceptives would obviously take away the need for this ritual.

4. Therapeutic and Criminal abortion — This is a question of considerable importance to-day, with criminal abortion being one of the chief causes of

maternal mortality. Most of those who seek the services of the criminal abortionist or the obstetrician for a therapeutic abortion, would have no such need whatsoever had they been taught the simple facts about present day contraceptive methods. More liberal use of contraception will not eliminate abortion, but it will certainly reduce the number of abortions.

Up to this point, our discussion has been of a general nature. We must now turn to some specifics. Although I feel that what has been said up till now is more than sufficient reason for a more liberal attitude toward birth control, I will present what are generally agreed upon to be specific or relative indications for contraceptive measures.

Indications for Contraception [4] and [5]

A. *Medical Indications to Prevent Aggravation of Illness or Disease*:

(poor maternity risks—those physically unfit for pregnancy account for ¼ of all maternal deaths (Eastman)).

1. Heart disease — not necessarily for the pregnancy itself but possibly for the mother who will have no help for the increased work load after birth of the child.
2. Tuberculosis
3. Some kidney diseases
4. Advanced diabetes especially with evidence of blood vessel damage.
5. Cancer of the breast or thyroid or other organ which has been removed within the last three years.
6. Pelvic disproportion or other gynecological problems such as a pelvic tumour.
7. Previous Caesarian section or toxemia of pregnancy are said by some to be indications for contraception.
8. Disseminated sclerosis
9. Parkinsonism
10. Mental and emotional breakdown occurring with pregnancy.

B. *Psychological*

1. Early married life — Since this is a period when the newlyweds must learn to adjust to one another, most authorities agree that a childless interval is definitely needed in order for the couple to accommodate to marriage.
2. Fear of unwanted conception — If the sex act cannot take place in an atmosphere of freedom and relaxation, then it cannot take place pleasurably and with the fullest satisfaction. All marriage authorities agree that poor sexual relations in a marriage is one of the major causes of marital discord. Clearly, contraception may be needed if only to maintain the stability of the home.

It has been shown that the wanted child has the best chance of obtaining the necessary love and attention from its parents, whereas the unwanted child is most likely to develop aggressions and hostilities which lead to antisocial behaviour.

C. *Pregnancy Spacing*

(The repetition of the strain of childbirth upon the mother at too frequent intervals, constitutes a hazard for even the healthy woman —Professor C. E. A Winslow, Yale School of Public Health. The minimum interval between pregnancies is generally agreed to be at least two years.)

Too short an interval between pregnancies may give rise to the following conditions:

1. Physical and emotional strains.
2. An increase in the incidence of varicose veins.

3. An increase in spontaneous abortion—(questionable).
4. An increase in placenta praevia — (questionable).
5. Relaxed vaginal tissues.
6. An increase in high blood pressure.

D. *Limiting Family Size*

(The average woman, if married at 20, and living another twenty-five years without contraception, can expect thirteen pregnancies and twelve live-born children.)

1. The parents may simply desire no more children. (family planning.)
2. Maternal and fetal death rate are sharply increased with the eighth birth. The death rate is lowest with the second child but begins to rise thereafter.

E. *Social and Economic Indications*

(The root of many medical problems is often economic (Eastman)).

1. The parents may not be able to afford more children so as to adequately provide for them.
2. The death rate of infants in lower income brackets is four times that in babies of the well-to-do.
3. There is evidence that there is a relationship between reckless childbearing and juvenile delinquency.

F. *Eugenics*

Parents are often advised not to have more children because of the possibility of transmitting some known defect to the child so that he might possibly be either physically or mentally retarded. Sterilization of one of the parents may be the only possible therapy in such a case, but intelligent use of a contraceptive may be all that is needed.

G. *Where the Partners are Unmarried or Not Married to Each Other*

This article was not intended either to condone or condemn pre-marital or extra-marital sexual intercourse. It is sufficient to say that these do exist regardless of existing laws and regardless of our own particular viewpoints. Needless to say, pregnancy in such instances is to be discouraged and I believe that the participants in these acts should be aware that contraceptives do exist and should be allowed to purchase them legally.

This completes the above list of indications for contraception. This is by no means a closed book or the last word, but the above summary should serve as an adequate guide for those physicians who feel that contraceptive education is part of their responsibility to their patients. It should be emphasized at this point that by and large, it is felt that the education of the public with respect to contraception and its methods lies mainly in the hands of doctors.[6]

In conclusion, it must be stated that planned parenthood affirms the infinite worth of a human being and that it is a true expression of respect for the human personality to plan the coming of children. The traditional attitudes toward contraception must change because in this day and age contraception is a must.

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The author wishes to express his gratitude to Dr. R. A. H. Kinch, for his suggestions and comments.

Some Considerations Against The Use of Contraception

L. L. de VEBER, M.D., F.R.C.P.(C)

General Remarks:

Contraception may be defined as the use of any means, mechanical or otherwise, which directly interfere with fertilization. Suppression of ovulation or spermatogenesis are also means of contraception although, technically, these are really temporary forms of sterilization. Contraception is only one means of controlling the birth rate. Thus, arguments against contraception in particular do not necessarily apply to the wider field of birth control.

Socio-Economic Considerations:

A great deal of the urgency and controversy about the use of contraceptives is based on fears of the "population explosion". Many demographers (i.e. economists and population experts) do not agree with the more popular pessimistic estimates of population expansion. Some of these experts such as Professor Clark of Oxford have suggested that more efforts should be directed to the problem of feeding the millions of starving people in the world. The food production in many countries could easily be doubled with the use of modern agricultural technology. Professor Clark has pointed out that the general rise in the standard of living plus other equalizing factors would eventually cause a significant decrease in the birth rate in many of these countries.

The impression has been created that the solution to the population problem in many of these countries would be a large army of willing volunteers distributing unlimited supplies of oral contraceptives. It is worthwhile examining the experience of the World Health Organization in India in this regard. A large part of the budget and personnel of this organization was devoted to a vigorous attempt to introduce a programme of birth control in this country. This programme was considered a failure due mainly to the mass resistance and suspicions on the part of the people. A complex of cultural and religious factors, as well as such economic factors as the need for male offspring to work the farms, were considered responsible for this resistance on the part of the people. Professor Paterson has pointed out another problem: "I do not believe that political leaders of a developing country or the people of the country will accept a program involving contraception until one can provide a reasonable guarantee concerning survival of children. Improvement and extension of maternal and child health services are necessary before any other advance can occur." Professor J. C. Snyder expressed similar views as reported in a newspaper article, "Early Infant Deaths Bar Birth Control." The use of oral contraceptives might avoid some of these problems. However, it is a sobering thought to consider the cost of continually supplying and distributing oral contraceptives to millions of people over a long period of time. It is questionable whether or not the UN or any other organization would undertake such a project. It might be that with perfections and developments in the rhythm technique that this would be a more acceptable means of birth control to many of these people.

A more direct way that has been suggested to reduce the birth rate in some of these countries would be to prevent, by law, early teenage marriages. An example of the effect of the age of marriage on the population may be seen in Ireland. For various cultural and economic reasons

the average age for marriage is over 30 years. This delay in marriage is considered to be a major reason for the shrinking population in Ireland, along with other factors such as emigration.

It is not the purpose of these considerations to deny or ignore the staggering problem involved in caring for the world's population. However, the solutions to this "population explosion" are obviously not going to be as simple and naive as has been suggested in many articles in the popular press and Medical Journals. Although many people appear to be concerned about the world population problem, in fact very few are going to be in a position to do very much about it. Therefore, it seems logical to consider the question of contraception as applied to our own country. In the first place, it is quite obvious that there is no problem with a "population explosion" in Canada. On the contrary, the country urgently needs large numbers of people to achieve its full potential as a nation. Therefore, arguments in favour of using contraception to reduce the birth rate certainly do not apply to our own country as a whole.

When we analyse the use of contraceptives on an individual basis other inconsistencies appear. In the first place, people in the lower socio-economic class, who presumably are producing more children than they can properly raise, are often quite resistant to any form of birth control, including contraception. In many cases vigorous public assistance might improve the situation but it is unlikely that it would be completely alleviated. On the other hand, there are many couples with one or no children who have a high standard of living and who could obviously easily afford to raise more. It is interesting to note that the most vociferous advocates of contraception are often those who are least in need of birth control themselves. In other words, if one takes an objective socio-economic point of view. when contraception is left to individual choice the results in terms of birth control are usually not the most advantageous to the community.

In recent years there has been an increase in teenage sexual promiscuity, with a closely parallel rise in venereal diseases, which have been well documented in the United States and Britain. Some authorities have placed a great deal of the blame for this increase on the widspread use of oral contraceptives among teenagers. The high illegitimacy rate among teenagers has been used as an excuse to distribute contraceptive devices and advice, but most authorities feel this would only make the problem worse. It seems hard to conceive that the widespread availability and use of oral contraceptives among the teenage population would ultimately have a beneficial effect on society.

Psychological Considerations:

As has already been mentioned, there is often a deep-rooted fear or superstition against the use of contraceptives which is a severe, limiting factor in attempts to control the birth rate in many nations.

Even among more sophisticated people, there has always been a certain amount of psychological resistance to the use of mechanical devices. It is interesting to note the change in attitude to these devices which were originally described as "essentials for feminine hygiene". In discussing the advantages of oral contraceptives, one hears these mechanical devices now described as crude and repugnant. (Doctor A. Guttmacher, President, Planned Parenthood Association). Although the use of oral contraceptives may avoid many of the psychological factors, there may be serious medical limitations to their use, particularly if used on a long-term, wide scale plan.

The question of the psychological effects of birth control and contraception on marriage and marital relations is a large question, and it is beyond the scope of

this article. However, it should be noted that marriage counsellors, obstetricians and gynaecologists are seeing an increasing number of childless couples, who having successfully avoided having children for many years for various socio-economic reasons are now faced with the problem of apparent sterility. Many of these couples have no organic reason for their sterility and might have been able to produce children at an earlier stage in their marriage. Another unexpected psychological problem which has arisen is the case of a wife using oral contraceptives for some period of time without the husband's knowledge. This is often the fault of the doctor for failing to tell the husband, who naturally would feel that his consent for the treatment should have been obtained.

Although there is no room in this article for a discussion of the purpose of marriage, one might question the approach of the marriage by couples who deliberately plan to avoid having children. The psychological effects on the woman, in particular, may be far more profound than the couple suspect.

Medical Considerations:

These are based mainly on the side effects from the oral contraceptives. These effects have been well documented and the short term side effects include weight gain, fluid retention, hypertension, severe mental depressions, and thrombophlebitis. A more serious side effect is death from a pulmonary embolus. More long-term effects involving pituitary suppression, and prolongation of the menopause with the possibility of late pregnancies. Also noted have been the rapid growth of uterine fibroids and benign and malignant breast tumours that were unsuspected at the time oral contraceptives were being used. Thus we may say that the long-term effects of oral contraceptives have not really been accurately assessed as yet. Many endocrinologists are also concerned about the results of prolonged use of oral contraceptives, particularly starting in the teens and carried on for periods of thirty or forty years.

Mechanical contraceptive devices are not completely harmless, either, since intrauterine devices such as Grafenburg Rings and spiral coils are known to cause endometritis, salpingo-oophoritis, perforation of the uterus and rupture of the bladder and bowel. Also the prolonged use of diaphragms and jellies has ben postulated to be an etiological factor in carcinoma of the cervix.

Moral and Religious Considerations:

The first question that must be answered here is whether or not there is a place for religious or moral considerations in the practice of medicine in general and in the field of contraception in particular. Obviously, this question will arouse very strong emotional reactions in many doctors who feel that there should be no interference in the care of their patients by the churches, the government or anyone else. It is natural that anyone-doctor, sociologist, politician—with no religious convictions and no belief in the supernatural should resent any religious intervention in these matters. However, we may then ask: if religious authority is denied a voice in these matters, where shall we look for moral guidance? Shall it be left to the individual scientist, politician or physician? Can it be left to the "moral consensus" of a given time and place?

Few people would be willing to entrust the answers to these problems to politicians. Scientists are being continually criticized for their lack of interest and lack of knowledge in subjects outside their field of studies. We have seen the retrospective moral anguish of certain scientists responsible for the production of the Atom bomb. We also note the apparent indifference of some biologists as they prepare to manipulate the genetic material of humans, or even the molecular basis of life itself,

without consideration of the long-term effects on the human race. We hear leading intellectuals, politicians and scientists advocating widespread programmes of euthanasia, sterilization, and eugenic legislation which are uncomfortably reminiscent of programmes carried out in Nazi Gemany.

What about physicians? Can they be relied upon to give consistent, expert moral guidance? Despite the fact that physicians may have the best interests of their patients at heart, and that good medicine is usually good morals, their decisions are often unwise in retrospect. An example was the reaction to the first report of the rubella syndrome, where the statistics were misinterpreted as indicating that nearly all pregnant women contracting rubella would deliver severely deformed infants. This resulted in large numbers of therapeutic abortions, with severe criticisms of any objections to this on moral grounds. Re-assessment of the original data and further propective studies have indicated that the maximum risk of deformities is 50% at best, and that most of these deformities can be corrected or are not too serious. Thus, medical teaching has changed on this subject to the point where many authorities doubt that there are any indications for therapeutic abortion in pregnant women who have had rubella. It is thus an unfortunate but obvious fact that intellectual ability cannot be equated with moral perception or competence, nor can one rely upon the "moral concensus" of society.

One can thus conclude that there is a place for the moral expert in giving guidance on vital questions of medical practice involving the taking of life, or the reproduction of life. We cannot expect doctors and scientists to be highly trained specialists in morality as well. We all accept the necessity of legal control of our civil activities and increasing government control of many of our social and economic activities; is it not logical to expect some control over our moral practices? Like other responsible scholars, moral theologians devote entire lives to the study of these problems, and they should be looked to for competent and skilled advice in their specialty. With all these considerations, it should not be difficult to see why religious authorities insist on having some say in decisions involving the morality of certain problems, and why doctors should be expected to listen.

The question of contraception presents a special problem in morality. Various Christian churches have gradually changed their teaching on the use of contraceptives from one extreme to the other, with the exception of the Roman Catholic Church. It should be emphasized that the Catholic church's teaching has an intellectual and rational basis, having the good of mankind as its deepest interest, as opposed to many of the arguments against contraception which are emotional and superficial despite their good intentions.

The Church's teaching is based on the interpretation of moral Theologians of the "natural law". Unhappily, the very term "natural law" causes both emotional opposition and semantic confusion, and it is beyond the scope of this article to dispel either. The natural law is a very profound concept which requires considerable study and thought, which are naturally lacking in most of its critics.

At the risk of oversimplification, the concept of the natural law involves the following convictions: there is a body of precepts and principles which man's reasors cannot ignore; there is a discernable order in the Universe which is ultimately the reflection of the Being of the Creator; there is a norm of morality which is beyond either individual conscience or "social consensus".

Such widely diverse voices as Robert M. Hutchins, Calvin D. Linton and Walter Lippman have all made strong appeals for a re-emphasis on such a "public philosophy," a "natural law". Their writings

agree to a large extent with Father John Courtney Murray who writes, "this is perenially the work of the barbarian, to undermine the rational standards of judgment, to corrupt the inherited intuitive wisdom by which people have always lived. Today the barbarian is the man who makes open and explicit rejection of the traditional role of reason and logic in human affairs. He is the man who reduces all spiritual and moral questions to the test of practical results or to an analysis of language or to decision in terms of individual subjective feeling". Thus we see that many people who are concerned with the present and future state of our society see a vital role for a "natural" or "moral" law in that society.

Next, we must insist that any appeal to "natural law" or "moral code" which does not admit the existence of God makes no sense. We may equally insist that the logical result of the denial of *any* ultimate Truth or Good is complete relativism, such as have been stated by many leading philosophers, historians, etc. The liberal Jewish historian, Eric Goldman of Princeton, in a very strong indictment of relativism, concluded that "Relativism . . . thus encourages a practice that usually needs little encouragement . . . justifying the means by the end."

We can also interpret our horrified reaction to the Nazi atrocities against the Jews as an appeal to the "natural law". We are not really saying it was wrong because an individual, community or mankind felt it was wrong and was horrified. We are saying that the rest of mankind was horrified because these acts were clearly "against nature",—against the evident order in the universe. It is on these concepts, then, that Catholic moral theologians base their arguments against contraception. The Church has no argument against birth control in general, and does not insist that all married couples should have an unlimited number of children. Pius XI pointed out that these children must be properly provided for and educated. The emphasis is on responsible parenthood and the individual conscience, as was stated by Father Richard McCormick, s.j.: "As long as the decision is the product of Christian prudence, the Church regards this as responsible Parenthood . . . Sound moral teaching proposes then not a quantity but a value or attitude toward it." Thus, the Church is not opposed to birth control, but rather to some of the means of birth control. Mechanical devices are wrong since they directly interfere with fertilization, and also mutilate the integrity of the marital act. They also interfere with the personal aspect of the marital act by destroying the quality of total self-giving. The use of hormones, which in effect cause temporary sterilization, is wrong when contraception is the main purpose of their use. Their effect would be considered the same as a temporary ligation of the fallopian tubes, from a moral point of view. When there is pathological uterine bleeding or incapacitating pain with menstruation, where hysterectomy would be medically indicated, then these drugs may be used. Also, when the menstrual cycle is grossly irregular and the practice of rhythm thus made impractical, a short trial with these drugs is permissible in an attempt to regulate the cycle.

A few Catholic theologians have speculated that further study of the action of these drugs may allow them to be used for contraception. These speculations are a healthy sign and have been present in the Church ever since the oral contraceptives were first introduced. However, at present, they represent neither the views of most theologians, nor the official teachings of the Church. Married couples thus have no right to use these scholarly speculations to anticipate a change in the Church's position.

There are always cases quoted where the Church's teaching seems unjust. However, no set of rules or laws can be expected to apply perfectly to all individual cases, and this is certainly true of the

Church's teachings on medical moral problems. Similarly, attempts to compromise or make exceptions to any set of rules or laws immediately weakens their effect and influence. Most of the cases quoted are not really insoluble when they are critically analyzed. In the few cases where married couples must suffer hardship or severe difficulties, the Church expects a certain amount of courage for the sake of the general good of society. It is often difficult to be sure of the official teachings of many of the Christian religions. This is obviously to a large degree due to the wide latitude allowed individual members in interpreting their Church's teachings.

In conclusion, further mention should be made of the Rhythm method of birth control. This is morally acceptable to the Catholic church since the Church is opposed neither to birth control nor family limitation, and since there is nothing about the method which directly interferes with fertilization or the marital act. There has been a long overdue resurgence of interest in the Rhythm method, with scientific research now being carried out in several centres. An example of recent developments in this field is a new hormone under study which is supposed to regulate the menstrual cycle without interfering with ovulation. This would, of course, be of great assistance in using the Rhythm method and would be morally acceptable to the Catholic church. Thus, it is likely that the efficiency and practicability of this method will be markedly increased in the future, as was predicted by Pope Pius XII. Also, this method will be made more available and useful through the use of "Rhythm Clinics" such as has been developed as a large scale public service in Buffalo, N.Y., and is planned on a smaller scale in other centres (including London, Ont.).

Conclusions

Some personal considerations against the use of contraceptives have been presented, which are not intended to be a comprehensive review of the subject. The Moral considerations are the most definitive and, therefore, the most important and the most controversial. An attempt has been made to show that society in general and doctors and scientists in particular should be prepared to accept some expert moral guidance in issues involving long range effects on the human race, such as the sanctity of life, birth control and contraception. The moral teachings of the Catholic church have been presented from this point of view.

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Contraception and the Law

VIRGINIA EDWARDS, '66

Canada, one of the wealthiest, most advanced and most envied countries in the world, has on its statute books a law which is openly and flagrantly disobeyed every day of the week. Since the law's introduction in 1892, it has been invoked six times resulting in only one conviction. The Toronto Daily Star said recently in an editorial: "Such unenforceable and unenforced laws breed hypocrisy and destroy respect for all laws."

In section 150, subsection 2c, of the Criminal Code of Canada, it is stated that, "Everyone commits an offence who . . . offers to sell, advertises, publishes an advertisement of, or has for sale or disposal any means, instructions, medicines, drug or article intended or represented as a method of preventing conception or causing abortion or miscarriage." The contraceptive aspect of this law is antiquated and hypocritical: first, because the majority of the populace disregard it openly and are not prosecuted, and second, because birth control is a known and accepted part of middle class married life in Canada.[6]

In 1936, Dorothea Palmer, an agent in the Parent's Information Bureau, in Ottawa (a birth control clinic established by A. R. Kaufman) was tried for distributing a pamphlet advertising birth control methods. Miss Palmer was acquitted and the judge's decision read as follows: "Here is an opportunity for the courts of law to keep abreast of the social developments of the community and to break away from the criticism that the law is rigid and at times obsolete."[1] That was 28 years ago and a private member's bill introduced this year to abolish the law was talked out of the Commons.

Non-drug store outlets are not allowed to sell contraceptives and yet a drug store can. This is on the pretext that they prevent disease.

In Britain there are Birth Control Education Clinics in the slums and these are not forbidden by law. The British Law Books list only one case in recent years. One of the partners did not agree to the use of contraceptives and had brought suit against the other.

In the United States only two states prohibit the sale of contraceptives, Connecticut and Massachusetts. In many of the others there are Active Planned Parenthood Associations in slum areas. Again there is the problem that the middle class can easily obtain birth control information and contraceptives from private physicians but welfare cases who are desperately in need of birth control for economic reasons find them much harder to obtain.

On the Connecticut Statute books, there is an 1879 law stating that "any person who uses any drug, medicinal article or instrument for the purpose of preventing conception shall be fined not less than $50.00 or imprisoned not less than sixty days nor more than one year or be both fined and imprisoned." This law was called into question in 1959 when Dr. C. Lee Buxton, Chairman of Obstetrics and Gynecology at Yale University School of Medicine and medical director of the Planned Parenthood Association of Connecticut openly disobeyed the law by giving birth control information publicly. He and Mrs. Richard Griswold, executive director of the league, were both found guilty by the state court. The case was then carried to the Supreme Court. They were prosecuted again on the grounds that this was a question of the state's right to "prohibit actions simply because they seriously and adversely affect community

morals independently of any injury to another and of any threat of physical evil to a society."[2]

Dr. Buxton again petitioned the Supreme Court on Sept. 15 of this year to repeal the law on the grounds that "the state may impose reasonable regulations on the practice of medicine, but a law which permits a doctor to abort his patient to save her life but prohibits advice for the use of the most effective means of preventing pregnancy and death has a negligible claim to reasonableness."[3]

Legislation and political planning on the subject of effective population control in various countries differs. In India, since the time of Ghandi, the government has actively tried to decrease the birth rate. S. Chandrasekhar noted that it was difficult for the people to use birth control as the cost of having a child was actually less than the cost of contraceptives.[4] But in recent years the results have ben favourable. This was accomplished by setting up Planned Parenthood Clinics all over the country and giving information and contraceptives free to as many people as desired them. The Japanese government after the war also actively cut down the birth rate by legalizing abortion and giving contraceptives. In Scandinavia and France birth control can be used although the governments try to discourage it because of a great decline in birth rate following World War II. In Puerto Rico and Ceylon, with densely populated and homogeneous groups of people, experiments were set up, first, to test the effectiveness of the new oral contraceptives and second, to see whether the reaction to birth control in general would be favourable. In Puerto Rico, a predominantly Catholic country, the contraceptives were well accepted.

In a recent meeting in Toronto, Lady Rama Rau of India, president of the International Planned Parenthood Association said, "You are a fortunate country, you have all the advantages that you can hope to have. Canada cannot keep out of the problems of the world, and Canada will have to take part, with the rest of the world, in solving the problems of population. It is up to you to take an interest."[5] At the U.N. in 1962, the Canadian delegates abstained from voting and even from discussing the problems of population control because of an antiquated law on our statute books.

The original reasons for the legislation being introduced as outlined by the Connecticut courts and applicable for Canadian law also are:

1) To ensure a stable or expanding population — this was necessary in 1897 when the bill was introduced but is now unnecessary and detrimental to society.

2) To limit relations outside marriage.

3) To control domestic morals—this is the major argument in the law courts against the repeal of the bill, for if the state cannot control domestic morals then it cannot prevent the practice of homosexuality.[2]

In this author's view, there are three reasons for not repealing the law in Canada. The major reason is the apathy of the Canadian people. When people openly and flagrantly disobey the law and are not prosecuted for it, then the law is meaningless and serves no purpose. This can only lead to chaos. This set of "dead words" must be changed for it is useless if the majority do not follow it.

The second reason is, as stated above, homosexuality will have to be made legal. This has been done in Britain with no major repercussions. The third reason given is that the Roman Catholic Church will strongly oppose such a change. The actual facts, however, as pointed out in Maclean's magazine last year are that many Roman Catholic leaders, even in Quebec, feel the legislation is undemocratic. "The political assumption that

Quebec wants to burden all of Canada with an obnoxious law has always been shaky, but when applied to the Quebec of 1964 it's insulting as well as unfounded."[6]

Recently many people have advocated the repeal of this law. Leaders of Protestant denominations have been especially prominent. Rt. Rev. H. R. Hunt, Anglican Bishop of Toronto said that the law is "antiquarian, hypocritical, ineffective and harmful" and as it now stands serves only to "promote disrespect for the law". The Unitarians, the Baptist Convention of Ontario and Quebec, and the United Church's Board of Evangelism have also asked for changes. Rev. James R. Roberts, of Vancouver's Catholic Matrimonial Tribunal says: "It's not a good law because it infringes on private morality. The Catholic Church by no means intends to foist its moral code on others." Dr. L. J. Harris of Toronto recently told the Canadian Medical Association: "The law is being violated hundreds of thousands of times every day. Practically all hospitals—with the possible exception of Roman Catholic hospitals—and practically all doctors discuss birth control with their patients."

On Sept. 12, 1964, a private member's bill was introduced in the House of Commons to remove the prohibition in the Criminal Code on the sale of contraceptives. The bill was sponsored by Robert Prittie (NDP) and seconded by Charles Willoughby (PC). It was talked out of the House on the grounds that it should provide controls to ensure that contraceptives are sold only on doctors' prescriptions to married couples and kept out of the hands of unmarried persons. The bill is not likely to come up for discussion again during this session of parliament.

Aristotle said: "Lawgivers make citizens good by developing in them habits of right action—this is the goal of all legislation and if it fails to do this it is a failure."

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Birth Control
An Historical Approach

E. RAGAN, B.A., '65

Scene: A physician talking to his patient at any time in history.

Physician: Mrs. Smith, do you know what the first oral contraceptive was?

Mrs. Smith: No!

Physician: That's correct!

Birth control is defined as any intentional method of preventing conception designed to limit family size. This, indeed, is not a new idea but has been a concern from the time man became a social animal and the family became the unit of society. It is logical to assume that true contraceptive techniques were first devised and attempted whenever man became sophisticated enough to understand the connection between intercourse and pregnancy. Although this initial premise is the basis of the rational methods of birth control, history recalls many mystical rites and magical potions that were used to inhibit conception.

Throughout history methods have been devised to barricade the entrance of the womb to semen. There were attempts to place mechanical and chemical barriers in the vagina and the mouth of the womb, to cleanse the vagina after intercourse, to discourage intercourse until a certain age, to educate the male to "retreat" before emission and to ensheath the penis so that the semen was not released into the vagina. Modern methods offer very little in principle from those of antiquity. Only in the last ten years, with the discovery of the effective control of the female's ovulatory cycle has any new and significantly modern method of birth control been introduced.

Even as the basic principles of birth control have not changed through the centuries, so the modern needs are quite similar to those of the ancients except that the perspective has expanded from the family unit and local community to the world community. The races of antiquity attempted contraception in order to decrease the high infant mortality rate, the suffering of childbirth, the repeated stillbirths, the danger to the mother's life and the economic difficulties of a large family. Today rampant procreation could lead to annihilation. In 1789 Thomas Robert Malthus, an English clergyman, restated the widespread idea that the world would have been completely populated if it had not been for the population reducing factors—disease, epidemics, war and misery. In 1958 The United Nations Department of Social and Economic Affairs estimated that, with the present rate of population expansion, there would be one human per square meter on the earth's surface by the twenty-sixth century. At present, there is a daily net increase of 85,000 humans on this planet. This progressive world population increase has been recognized as an urgent problem in recent years especially and an obvious solution is a drop in birth rate by the use of effective contraception.

The earliest means of controlling family size was not by contraception but by abortion and infanticide in one crude way or another. The first account of a method of contraception may be found in Genesis, Chapter 38. Onan was unwilling to obey his father's order to carry out his duty to his late brother by providing him with an heir. "Onan knew that the seed should not be his, and it came to pass when he went into his brother's wife, that he

spilled it on the ground, lest he should give his seed to his brother." His act, coitus interruptus or withdrawal, has been misinterpreted as masturbation and has been subject to religious censorship.

The Egyptians, Hebrews, early Christians, Greeks and Romans all knew how to control birth rates. The Egyptian papyri, dating back four thousand years, are the oldest known medical records and describe several methods of contraception. The papyri were compiled from sacred books which were supposed to have been written by Toth, the god of wisdom. In the Westcar papyrus of 1700 B.C., the duration of pregnancy was known and intercourse was related to pregnancy. The Ebers papyrus dating from about 1500 B.C. contains a recipe "in order to cause a woman to cease to conceive for one year, two years or three years" and included, "tips of acacia" mixed with honey and applied to a piece of lint which was placed in the vagina. Another method, documented in the Egyptian papyri and still practised by the Dahomey tribe of West Africa, used a particular root which was crushed and inserted as a high intravaginal plug.

The Hebrew writings advocated placing spongy substances in the vagina and recommended these absorbents to three types of women: a minor, lest pregnancy prove fatal; a pregnant woman, lest abortion ensue; a nursing mother, lest she prematurely wean a child so that it dies.

Plato and Aristotle were in favour of keeping the Greek city-state population at a constant level and for this they recommended (along with abortion and infanticide) that men only between the ages of 20 and 35 be allowed to father children and women between 20 and 40 be allowed to bear them.

Soranus of Ephesus who lived in the first century A.D. is considered to have been the first specialist in obstetrics and gynaecology. In his youth he studied medicine in Alexandria and later practised in Rome during the time of Trajan and Hadrian. He was an original, able and judicious thinker. During his lifetime he wrote twenty medical books, the most important of which was his "Gynaecology". Here he discussed whether one ought to make use of abortives and contraceptives. He said that it would be safer to prevent conception from taking place than to destroy the fetus and proceeded to outline his various methods of prevention. He proposed the use of different types of vaginal plugs, astringent solutions and warned against superstitious practices. He advocated coitus interruptus, smearing the cervix with thick tenacious vegetable products like cedar resin or putting a lock of fine wool into the orifice of the uterus.

From these writings it can be seen that the ancients actually set the stage for the modern contraceptive techniques. Ephesus' lock of wool in the cervical orifice has led to the intrauterine pessaries and modern "spirals"; the Hebrew absorbents and other intravaginal plugs have led to cervical cups and vaginal diaphragm pessaries; the recommendation of smearing the cervix with a thick tenacious material has led to spermicidal jellies and creams; the postcoital cleansing of the vagina has led to vaginal douching; the mystical potions and magical rites have led to the contraceptive pills; and withdrawal, late marriage and abstinence have led to fustration and anxiety.

Some other methods, though rational but less practical, are being practised today by some primitive Australian tribes, whose current mental development date them back to the Stone Age. One of their methods is called the "Mika" operation and involves slitting the urethra with a stone knife at the lower side of the penis. On ejaculation the surgically produced orifice emits the semen. This could have been a method used by our cave-dwelling ancestors.

Nothing ostensibly new was added to the history of contraception from the time

of Soranus for about 1400 years until the middlde of the 16th century. In 1564 Gabriel Fallopio, the great Italian anatomist and authority on syphilis first described the sheath or condom. Its origins are believed to stem from the penis protectors worn by the Egyptians to ward off tropical diseases and insect bites. Fallopio recommended that the sheath be used for protection from syphilis and claimed that in an experiment on 1100 men not one was infected. The sheath first made of linen, was later made of isinglass, caecum of lamb and finally with the vulcanization of rubber it became inexpensive and popular. Casanova is recorded to have said that the sheath was something no man should travel without. Madame de Sévigné writing to her daughter describes the condom as "a bulwark against enjoyment and a cobweb against danger", thus anticipating a present day verdict on the part of some women. In the 18th century the condom was a staple in the brothels of England. Mrs. Philips, a London business woman and manufacturer of these "machines made of finest linen" recommended them to ship captains and all gentlemen going abroad.

The beginning of the 19th century heralded the new thinking regarding the needs for contraception. Infant mortality and maternal morbidity were gradually being decreased and now the socio-economic aspects of the population increase were being debated and discussed. The idea that the expanding population would soon outgrow the food supply was proposed by Malthus and he suggested late marriage as a control measure. Francis Place in his famous book of 1822 "Prin ciples of Population", boldly attacked Malthus and demonstrated the utter futility of deferred marriage. Place said that "The only remedy can be found in preventives", and in a later anonymous publication (subsequently attributed to Place) called the "Diabolical Handbill" he described in detail how conception could be prevented by placing a sponge into the vagina prior to intercourse or if the sponge was not handy the husband could withdraw prior to emission. The latter method he called the Retreat and it was also called by softer names—La Prudence or La Discrétion. These methods are not new in the historical concept but were new in relation to their times and goal of population control.

Proven methods of conception control were well known by the middle of the 19tht century but the information was only available to the literate, highly educated, rich classes. These people knew well how to control the size of their families but it was not these people who really needed the information. The need was with the poor, illiterate, slum-dwellers who were living in filth and poverty and were having as many children as the mother's body would endure.

Historically speaking, the scene shifts three decades from the development of methods of birth control to the struggle to educate the people about the methods. In the United States Charles Knowlton, Robert Dickinson and Margaret Sanger laid the cornerstone and built the educational programme to inform all interested parties of the methods of birth control. Knowlton's weapons were the spoken word, the pen and public print. Dickinson added the pencil, the drawing board and the model. Both belonged to a group of physicians who gave leadership to lay groups led by the famous nurse, Margaret Sanger. It was Margaret Sanger who coined the words "birth control" and who fought the Roman Catholic church, the law and all other opposition groups to finally win out and establish clinics to teach women the methods of family planning.

Margaret Sanger said, "I associated poverty, toil, unemployment, cruelty, quarrelling, fighting, debts, jails with large families. Women from time immemorial have tried to avoid unwanted motherhood." She could find no adequate information on birth control in the U.S. and so

went to England where she met Marie Stopes, her English counterpart. From England she went to Holland where, at the Jacobs Clinic directed by Dr. Oletta Jacobs, she learned about the use of the Mensinga pessary, designed in 1842 by Dr. Mensinga a German physician. Her battle was a difficult one but her goal was achieved.

The modern era of contraception was born in 1929 when Dr. Ogino in Japan and Dr. Knaus in Prague independently established the correct time of ovulation and descibed the period of maximum fertility and safe periods. The Roman Catholic Church, which had to this time condemned birth control as sinful, immoral and against the laws of nature, immediately seized these findings and introduced the "Rhythm Method" of family control in a paper published with official sanction entitled "The Rhythm of Sterility and Fertility in Women". It was now possible for Roman Catholics to avoid large families by limiting intercourse to the time when conception could not take place. A few years later, in 1937, Makepeace showed that when progesterone was administered to rabbits ovulation was inhibited. Later, in 1953, Pincus and his co-workers demonstrated that the 19-norsteroids were effective as contraceptive agents. It was then shown that a combination of progesterone plus estrogen taken in a cyclic fashion would inhibit ovulation but would otherwise not change a woman's normal menstrual pattern.

Maybe some of the magical potions used in ancient times were in fact ovulation inhibitors; maybe the intravaginal creams and ointments were adequate spermicidal agents. But now, after 4,000 years, when contraceptive methods are based on the scientific approach man has the 100% effective contraceptive.

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Methods of Contraception and their Relative Efficiency

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The methods of contraception are many and varied. The effectiveness depends not only on the method employed, but also on the individual's understanding and regularity of use of the contraceptive measure.

Before considering the methods of preventing conception it should be pointed out that there are certain basic principles to be remembered;

1. any method of birth control is more effective than no method.
2. the effective method of birth control is the one a couple will use with the greatest consistency.
3. acceptability is the most critical factor in the effectiveness of a contraceptive method.

A. Methods

(1) *The Sheath*

This is a common device used to prevent conception, of which there are three varieties,

a) rubber washable sheaths
b) fine animal skins
c) rubber condoms ('French letters')

The sheath is worn by the male partner which serves to cover the penis. There are many precautions to be taken when this method of contraception is used;

a) it should be used in conjunction with a lubricant, preferably one which contains a spermicide.
b) a sheath with a teat end is sometimes recommended, for if the sheath fits tightly over the glans and body of the penis, the rubber covering the glans will be stretched when ejaculation takes place. This may then cause the semen to be forced backwards to the base of the sheath, and enough may escape on to the vulva to effect fertilization. This cannot happen if the sheath has a teat end which is collapsed when the sheath is adjusted.
c) if the sheath is to be used again, it should be washed, dried, and powdered after use and put away folded, not rolled up. The condom type is generally supplied rolled like a finger stall, and is not intended for repeat use.

The disadvantages of this method are mainly aesthetic in that many men and women dislike it and feel that it deprives the sexual act of much of its essential significance. Also a not infrequent irritation is produced in the female partner. Cessation of love play in order to put the sheath on is perhaps the commonest complaint.

(2) *Coitus interruptus*

This is probably the oldest method used in birth control. The practice of withdrawal before ejaculation is almost universally known, it costs nothing, and requires no preparation. From the point of view of safety the method must always be considered hazardous, on account of the few spermatozoa in the pre-ejaculatory fluid.

Withdrawal before ejaculation generally causes some deprivation of pleasure to the male partner, as well as a strain of keeping control throughout a process in which its maintenance may require an overwhelming effort. Among women there are some on whom withdrawal may have little or no ill-effect as, for example, women who can reach their orgasm either before or in spite of withdrawal.

There is a very common but entirely erroneous belief that if the woman does not experience an orgasm the likelihood of pregnancy will be much diminished. This practice of exerting so much mental control that the orgasm is entirely inhibited is termed "holding back". This is very harmful to a woman as this repeated frustration will lead in many instances to frigidity, and an imposed frigidity of this type is always detrimental to the emotional health.

(3) *Spermicidal preparations*

a) suppositories and tablets

These are inserted deeply into the vagina prior to intercourse and usually an interval of ten minutes is required before their optimum effect is obtained. Contraceptives of this sort are of four types;

1. cocoa butter type
   This consists of a cone of cocoa butter containing about two grains of a quinine salt. Such a suppository melts in the vagina and produces a thin greasy film over the vaginal mucosa. Investigation has shown that the efficiency of this preparation depends less on the quinine content than on the greasiness of the base, which has a mechanically inhibiting effect on spermatozoa.
2. glycerin and gelatin type
   This type has no odour and does not irritate, but some women dislike the slight stickiness; in some cases, too, they appear to be hygroscopic, causing excessive vaginal moisture.
3. foam tablets
   These embody the spermicidal substance in a base consisting of compounds which in the presence of moisture, interact with the production of a more or less dense foam. The function of the foam is to serve as a vehicle for the spermicide and at the same time act as a mechanical barrier across the vaginal vault and external os. The chief disadvantage is that the efficiency of these tablets depends upon a very variable factor, namely, the amount of vaginal moisture.
4. aerosol foam
   This preparation acts in a similar manner to the foam tablets, except that vaginal moisture is not a prerequisite. The foam may be injected up to two hours prior to intercourse.

b) jellies and creams

These preparation come in a collapsible tube along with an accompanying instrument which serves to introduce the jelly or cream into the vagina. These have the advantage of being introduced into the vagina in a dissolved and active condition. Jellies are of two main types, simple and foaming; in the former the spermicidal substance is incorporated in a water-soluble base, in the latter an acid and alkaline substance in separate compartments of a tube are mixed together when squeezed through the nozzle and produce a fine foam of jelly and carbon dioxide.

(4) *Post-coital douche*

This method is fairly widely practiced but is very unreliable in preventing conception. Probably the chief reason for the fallability in this method is that if semen is deposited against the external os, spermatozoa will pass within a minute or so into the cervical canal and become inaccessible to the douching solution.

Plain water or one tablespoon of vinegar to a pint of warm water are the best and safest solutions to use.

(5) *The rhythm method or 'safe period'*

To those of the Catholic faith the only permissible means of controlling conception is that of abstention from coitus at certain periods of the menstrual cycle, in the belief that only at those phases is conception likely to occur.

The rationale of this method is based on the following;

a) ovulation usually occurs at approximately the same date in any given menstrual cycle

b) the ovum is capable of being fertil ized only for a period of forty-eight hours, at most, after ovulation.

c) spermatozoa are likewise short-lived and are incapable of fertilizing an ovum for more than forty-eight hours, at most, after ejaculation.

Since the 'fertile period' varies for each woman and sometimes from month to month in the same woman, so this method can be very unreliable unless certain conditions are followed;

a) before embarking on the method an accurate record of at least nine, preferably twelve, menstrual cycles must be kept

b) the woman would be well advised to keep a basal temperature chart

c) the husband must be willing to abstain completely during his wife's fertile days, or some other method of birth control must be used during that time

d) the couple must have sufficient intelligence and persistence to understand and follow the instructions

e) the 'safe period' is quite unreliable postpartum until a recognizable pattern is re-established. It also becomes undependable as the menopause approaches.

(6) *The occlusive cap*

a) the Dutch cap

This cap consists of a circular watchspring covered by rubber which forms the rim, and across it is stretched a soft dome of rubber, the diaphragm.

The cap is fitted obliquely across the vaginal passage, the upper and posterior part of the rim coming to lie in the posterior fornix, and the lower and anterior part lying behind and above the back of the pubic bone, within an inch or so of the vaginal orifice. Usually the cap is inserted with the dome uppermost towards the cervix, this position slightly facilitating its removal. The accurate fit depends on the tone of the vaginal musculature, a factor which varies slightly from time to time. After a debilitating illness or after childbirth the cap should be refitted, and during the early months of marriage it may require changing two or three times.

b) the Dumas cap

This cap is intended to fit into the vault of the vagina, reaching from the anterior to posterior fornix and thus covering the cervix. The dome of the cap is stiff rubber and it is supported from below by the bulging in of the vaginal walls, and in some instances is said to adhere to the vaginal vault by suction.

In general, the Dumas cap is unsuitable in cases in which the cervix is large or pointed, as the dome is not deep enough to contain any but a flat cervix. It should not be worn over a cervix which is pointing backwards or is even at right angles to the axis of the vagina for in these instances it is liable to become dislodged by the penis. The cases for which it is best adapted are those of prolapse with cystocoele, rectocoele or both.

c) the cervical cap

This rubber, metal or plastic cap is designed to fit on to the cervix itself and is independent of support from the vaginal walls. A small tag is sometimes attached to facilitate extraction. This type of cap should be prescribed in cases in which the cervix is well formed and free of any lacerations reaching to the cervical base. It is most suitable in cases in which the uterus is retroverted and the cervix presents in the axis of the vagina. The cap is not intended to fit the cervix exactly. The dome should extend further than the cervix, this surplus being for the reception of the cervical secretion.

There are some general principles which should be followed in the use of occlusive caps;

1. a non-irritant spermicidal jelly should be thickly applied to the cervical surface of the cap.

2. if possible, the cap should be inserted a little time before coitus.

3. a chemical suppository or jelly may be added shortly before coitus.

4. the cap should be left in position for at least ten hours after the last coitus.

5. the cap should be washed with soap and water, dried and powdered before storing.

6. the cap should never be left in position longer than eighteen hours.

(7) *The diaphragm*

The diaphragm ring is composed of either flexible rubber or a coil spring, the area between being covered by a dome of synthetic rubber. The size of the diaphragm needed is determined by the physician who performs a two-finger vaginal examination of the patient.

Some diaphragms must be inserted digitally while others are accompanied by separate plastic inserters. A vaginal cream or jelly is deposited in the cup of the diaphragm and on the rim prior to insertion into the vagina. In fitting the diaphragm into place the main consideration is that the upper edge be securely lodged behind the cervix, so as to be sure to cover it. A new application of cream or jelly should be added prior to every renewed act of coitus, and the diaphragm should be left in place at least eight hours after the last union.

(8) *Sponges and tampons*

These are sometimes advised when the male partner cannot be relied upon to use a sheath and when the female partner suffers from some form of displacement which makes the fitting of a cap or diaphragm difficult.

These are rarely used today on the grounds that they lead to dyspareunia and unless the sponge is carefully looked after, it may quickly become septic.

(9) *Intra-uterine methods*

a) Grafenberg's ring

This is a small flexible ring made of closely coiled silver wire, which is passed through the cervical canal into the body of the uterus, where unless untoward symptoms appear, it is allowed to remain for a year or more at a time. The ring is introduced in the immediate post-menstrual period to avoid disruption of possible early pregnancy. As a rule there is some staining after insertion which may last for a few days, and slight abdominal cramps may persist for forty-eight hours. The patient is asked to return after each of her next two menstrual periods and then again in six months in order to check the position of the ring, which is done by passing a sound into the body of the uterus.

According to one authority the ring is expelled in over ten percent of cases, sometimes without the patient's knowledge. Furthermore, there are some women in whom the ring provokes uterine pain, mennorrhagia, metrorrhagia, and even more serious, its presence is held by some to have provoked acute PID. If pregnancy occurs with the ring in place, it usually proceeds to full term and ends in the normal birth of an undamaged infant; but if abortion occurs the presence of the ring is stated to increase the risk of complications.

This method of contraception is currently being brought back into favour, as many gynaecological centres in both Canada and the United States are inserting polyethylene devices of various shapes and sizes into women who desire them. Complications have been few and this method may indeed become the most popular in the near future.

b) the stud or wishbone pessary

This device is usually made of gold, in a number of shapes of which the most usual resembles a stud with a bifurcating stem and a disc-like lower end. The rami of the stem are pressed together when the

appliance is introduced into the cervical canal and when released they separate, acting as a self-retaining device.

These pessaries are very dangerous in that they serve to form a path from the vagina into the uterus along which bacteria can pass and cause infection leading to septic abortion, PID and fatal peritonitis.

(10) *Oral progestins*

This method today has become a very favourable contraceptive device for many couples. The tablets are made up of both oestrogenic and progestational substances. After the woman has taken one tablet each day beginning with the fifth day of the menstrual cycle, for twenty days, withdrawal bleeding then occurs within two to four days after discontinuation.

The disadvantages of this method are the relatively high cost and the varied side-effects which are possible and which occur in fifteen percent of cases.

(A more detailed study of oral contraception appears elsewhere in this Journal.)

(11) *Other methods*

The contraceptive measures listed below are rarely used and are included only for completeness;

a) irradiation of the ovaries and testes to produce temporary sterility.

b) injection of semen as an antigen for the purpose of producing spermatotoxic antibodies.

c) application of heat to the testes to arrest spermatogenesis.

B. Relative Efficiency

An efficient approach to the study of the effectiveness of contraception other than the percentages of successes and failures was developed by Raymond Pearl. This is the pregnancy rate per 100 years of exposure computed by the following formula,

$$R = \frac{\text{total number of conceptions} \times 1200}{\text{total months of exposure}}$$

Clinical effectiveness, also known as "use effectiveness", is the measure of protection achieved by a group of couples using contraception more or less consistently and with more or less care and skill. Clinical effectiveness reflects physiologic effectiveness, which is the measure of protection against unwanted pregnancy afforded by a specific contraceptive method under ideal conditions, i.e. used consistently and according to instructions, without omissions or errors in technique, but is necessarily modified by the nature of the human population concerned.

The clinical effectiveness of the most common methods of contraception is given in the following table:

Method	*Range (R)*
none	150-200
rhythm	14-35
withdrawal	3-38
douche	18-36
condom	6-28
diaphragm or cap	3-34
suppositories	8-42
foam tablets	6-49
jelly or cream (alone)	5-36
Grafenberg's ring	1-4
oral progestins	0-2.3

Clinical effectiveness is generally higher for the same method among the more intelligent and better-educated segments of the population than among the backward and underprivileged. It is higher in cities than in rural areas and higher among couples seeking contraceptive advice on their own initiative than among those who have been persuaded by social workers or others to attend a clinic.

Conclusion

A satisfactory method of contraception should be harmless, both physically and psychologically, easy to use, reliable and inexpensive. Unfortunately there are objections to all the commonly used methods, but since the alternative is repeated pregnancy most couples try to make the best of the methods available.

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"The Magic Pill": A Discussion of the Oral Contraceptives

GARY G. FERGUSON, '65

Introduction

As the contents of this issue of the *Journal* demonstrate, complete mastery over the fundamental human function of reproduction has been one of the great quests of mankind. With the discovery by Rock and Pincus in the early 1950's of the unique contraceptive properties of oestrogen-progestin combinations, such mastery became fact for the first time in human history. Certainly the oral contraceptive must share with the ataractics, the distinction of being the most widely studied, discussed, praised, and condemned group of drugs in the past decade.

The discovery of the contraceptive properties of oestrogen-progestin combinations arose out of studies by Rock with the newly discovered 19-nortestosterones, synthetic progestational agents, which could be taken orally. It was known since the 1920's that progesterone had contraceptive properties, but the fact that it could not be administered orally made this of little importance. It was soon found, however, that the new synthetic progestins shared this contraceptive property of progesterone, and in 1956, Rock and Pincus began the first large-scale clinical trials with oral contraceptives in San Juan, Puerto Rico.

As a measure of the acceptance of these drugs since that time, G. D. Searle & Co., the manufacturer of "Enovid", the first of many brands on the market, estimates that in North America there are now 2.5 million users of their product. It should thus be obvious to all that the oral contraceptives are now an extremely important part of the medical armament.

Preparations (see Table 1)

All of the oral contraceptives marketed to date contain a synthetic progestational steroid combined with an oestrogen; either, mestranol (ethynyl estradiol-3-methyl ether) or ethynyl estradiol. The most commonly used progestins are the 19-nortestosterone derivatives which include norethynodrel, norethindrone and norethindrone acetate. The 3-desoxy, 19-nortestosterones are used in Europe, an example being ethynylestranol. Other progestin compounds used include medroxyprogesterone ("Provera"), 17-acetoxyprogesterone and 6-dehydroretro-progesterone ("Duphaston"). Many new products have come on the market recently, incorporating lower dosages of progestins, the signifance of which will be discussed below. Since the potential market in oral contraceptives is so great, many more new products can be expected in the future.

TABLE I – ORAL CONTRACEPTIVE PREPARATIONS

Brand Name	Company	Progestin	Oestrogen
Enovid-10 mg.	Searle	norethynodrel (9.85 mg.)	mestranol (0.15 mg.)
Enovid-5 mg.	Searle	norethynodrel (5 mg.)	mestranol (0.075 mg.)
Enovid - E	Searle	norethynodrel (2.5 mg.)	mestranol (0.1 mg.)
Ortho-Novum (5 mg.)	Ortho	norethindrone (5.0 mg.)	mestranol (0.075 mg.)
Ortho-Novum (2 mg.)	Ortho	norethindrone (2.0 mg.)	mestranol (0.1 mg.)
Norinyl	Syntex	norethindrone (2.0 mg.)	mestronol (0.1 mg.)
Norlestrin	Parke. Davis	norethindrone acetate (2.5 mg.)	ethynyl estradiol (0.05 mg.)
Anovular	Parke, Davis	norethindrone acetate (4.0 mg.)	ethynyl estradiol (0.05 mg.)
Provest	Upjohn	medroxyprogesterone (10 mg.)	ethynyl estradiol (0.05 mg.)

Method of Use

In all cases, the drugs are recommended for use over a 20 day period in each menstrual cycle. One pill is taken each day and it is usually suggested that they be taken either after dinner or at bedtime. The first day of the cycle is the first day of menstruation, but the first pill is not taken until day 5 of the cycle. The pills are packaged in 20's, in many ingenious ways, which tend to minimize error by the patient. For example, "Otho-Novum" comes in a "Dial-Pak", which dispenses one pill per day for twenty days. The last pill is then taken on day 24 of the cycle. Menstruation, which is in fact withdrawal bleeding, usually begins within three days and the cycle is repeated. If no withdrawal bleeding occurs, which sometimes happens, the patient should allow seven days to pass and recommence taking pills on the eighth day. If this schedule is adhered to, there is no possibility of conception. One pill per cycle can be missed without danger of conception, but if two or more pills are forgotten, pregnancy may occur, and thus an alternate form of contraception should be used until a new cycle can be begun. The cost of 20 tablets or a month's supply ranges from $1.50 to $4.00 depending on the dosage.

During the last few years, a method of "sequential" use for these drugs has been developed and is at present being tested. In contrast to the original ideas concerning the mechanism of action of the oral contraceptives, it is now believed that the oestrogen is the ovulation inhibitor, while the progestin creates the necessary changes in the endometrium for withdrawal bleeding. Therefore, in the "sequential" method, oestrogen is given alone for 15 days to which a progestin is added for the last five days. The advantage of this method is that it reduces the amount of hormones being given per cycle and should thus reduce both cost and the incidence of minor side effects. Although the reliability of this method has not been established, initial reports indicate that it is as effective as the method currently recommended.

Another improvement in the oral contraceptives has been the progressive lowering of the progestin dose. The original pills contained 10 mg. of progestational agent. Most pills prescribed today contain 5mg., 2.5 mg. or 2.0 mg. of progestin. Coincident with this has been an increase in the proportion of oestrogen used. Lower dosage pills have been developed to reduce cost and the incidence of minor side effects. Tyler has done clinical trials on these new pills at the Los Angeles Planned Parenthood Centre, where he found in comparing them to 10 mg. pills that they are equally as effective. In terms of patient acceptance and side effects, the low dosage pills were superior. While there had been a 4% drop-out rate with the 10 mg. pill, there was only a 2% rate with the 2 mg. one. Breakthrough bleeding occurred in 20% of the patients taking the 10 mg. pill as opposed to 10% for the 2 mg. pill. On the 10 mg. pill, 80.7% of the patients experienced weight gain and in 18.7%, this was 15 lbs. or over; whereas, only 57.4% had weight gain with the lower dosage. No one on the 2 mg. pill dropped out of the study because of gastro-intestinal complaints and only 3.6% experienced nausea or vomiting during the study as against 12.2% for the high dosage pill.

Mechanism of Action

Although the mechanism of action of the contraceptive drugs is not yet fully understood, it is now known that both the oestrogens and the progestational steroids have contraceptive properties. The oestrogens inhibit anterior pituitary gonadotrophin production, thus resulting in suppression of ovarian function and ovulation. As for the progestins, recent studies on the metabolism of the 19-norsteroids suggest that they are metabolized, in *vivo*, to ethynyl estradiol. Some workers now

question whether the progestins are necessary constituents of the pills. Are they not rather an expensive form of giving oestrogen?

Together with this direct hormonal inhibition of ovulation, the oral contraceptives have two other effects on the genital tract which enhance their effectiveness. The cervical mucus becomes impenetrable to sperm as a result of being altered from its normal thin, watery consistency to a thick, viscous state. Also, the endometrium becomes unsuitable for the implantation of the ovum. In the latter half of the cycle, the endometrial glands, rather than assuming the "corkscrew" appearance characteristic of the normal secretory phase, regress to an atrophic post-menopausal appearance. This glandular atrophy is accompanied by extreme stromal stimulation, so that by the seventeenth day it resembles the decidua of early pregnancy.

Effectiveness and Advantages

As it soon became obvious in the first clinical trials in Puerto Rico and has since been confirmed by many workers, the oral contraceptives, used as directed, are absolutely 100% effective. This is a claim which can be made for no other contraceptive means other than abstinence. Any pregnancies occurring during use of the drugs in clinical trials have been the result of failure by the patient to follow instructions. Goldzieher has estimated that the oral contraceptives are at least 20 and perhaps 50 times more effective than any other method. Comparing pregnancy rates as a function of 1200 months of exposure, the oral tablets have a rate of 0-2.3; whereas, the normal pregnancy rate is 150-200. Comparative rates for the diaphragm, the condom, and jelly or cream are 3-34, 6-28, and 5-36 respectively.

Equally important as their contraceptive ability, the pills have no detrimental effect on future fertility and may even increase subsequent fertility as the result of a "rebound" phenomenon. These drugs do not cause significant abnormalities of the menstrual cycle, rather there is an increased regularity of the cycle, though the duration and quantity of flow is commonly decreased. In 50% of patients there is a reported increase in libido. This may result from the removal of the fear of unwanted pregnancy. Other advantages of these drugs are that they are cheap, extremely simple and pleasant to use, and have infinitely greater aesthetic appeal for both husband and wife compared to other means. They are pleasant to use because they are unrelated to the time of intercourse and hence avoid the psychological barriers to successful intercourse which may occur with other methods.

Incidental to the present discussion, there are other uses for the oestrogen-progestin drugs, including:

1. The control of dysfunctional uterine bleeding.
2. The regulation of abnormal and irregular menstrual cycles.
3. The enhancement of fertility.
4. The medical treatment of endometriosis.
5. The support of pregnancies threatened with abortion.

Side Effects

No toxic effects from the use of the oral contraceptives have yet been absolutely established. However, there is no question that in a certain percentage of patients using these drugs annoying side effects do occur. In most cases, these are minor and short-lived. In some instances, the pills are discontinued as a result.

Most of the minor side effects are predictable on the basis of the known pharmacology of the hormones involved and in many instances they resemble the symptomatology of early pregnancy. Other side effects, which are unpredictable and unexpected, have been reported associated with use of the pills, but in no instance

has a direct causal relationship been established. These unpredictable side effects are rare occurrences. Finally, there are certain hypothetical complications to the use of these drugs which have been raised both by the lay public and the medical profession. These involve possible long-term effects.

The predictable side effects include gastrointestinal upsets, weight gain, break-through bleeding, menstrual irregularities, mastalgia and breast engorgement, chloasma, and acne. These minor side effects result from increased oestrogen levels in the patient and though they may be annoying if they occur, they are usually of short duration and mild intensity.

Gastrointestinal complaints, namely, nausea and vomiting, are the most common minor side effects resulting from the use of these drugs and account for the majority of the "drop-outs" in clinical trials. It should be understood, however, that many "drop-outs" are individuals who are poorly motivated and who have been unduly influenced by adverse reports appearing in the press concerning the oral contraceptives. Nausea and vomiting, when they occur, are usually maximal in the first cycle and have usually disappeared by the fourth cycle. The oestrogens are responsible for the nausea and vomiting but the 19-norsteroids, as a result of their metabolism, add to the oestrogen level. To minimize the gastrointestinal complaints, the pills should be taken after dinner or before retiring. The newer preparations incorporating lowered dosages and more potent progestins, have resulted in a decrease in these unpleasant side effects.

Weight gain commonly occurs. Two reasons for this are that the steroid hormones used result in water retention and, also, oestrogen has some anabolic activity.

Break-through bleeding, defined as spotting or bleeding at times of the cycle other than the menstrual period, does occur in some patients and may be a source of alarm to them. Pincus reports that with "Enovid" 6% experience break-through bleeding in the first cycle with the 10 mg. pill as compared to 14.6% with the 5 mg. pill. If break-through bleeding occurs, it is recommended that the dosage be doubled for a few days. The occurrence of break-through bleeding depends mostly upon individual susceptibility and upon irregularity in the taking of the pills. If the pills are taken at the same hour each day, fluctuations in blood hormone levels and, thus, the chance of break-through bleeding, are minimized.

Oligomenorrhea is common throughout therapy and amenorrheic cycles may occur. The patient should be forewarned of these possibilities; for, if the pills have been taken as directed, there is no chance of conception.

Mastalgia will disappear after a few cycles. Breast enlargement is common and is often received with approval. Chloasma may occasionally be marked, especially in warmer climates. Acne may develop, though rarely.

In contrast to the predictable minor side effects, certain unpredictable side effects have been the cause of great concern. These include: thromboembolic disease, the development of uterine fibroids, foetal masculinization, aggravation of diabetes mellitus, precipitation of depression, and changes in liver function tests.

In 1962, reports of severe thromboembolic disease with the occasional fatal massive pulmonary embolus occurring in otherwise healthy young women co-incident with the use of oral contraceptives, began to appear in the literature. Naturally, this created consternation in the profession, for the use of the drugs could hardly be condoned in the light of possible fatal consequences. On August 7, 1962, G. D. Searle & Co. sent a "Drug Caution" letter to all physicians in North America requesting them to report any cases of thromboembolic disease among

"Envoid users. They also recommended caution in the use of "Enovid" in the presence of thromboembolic disease or a history of it. Fearnley and Phillips hypothesized an explanation for this occurrence on the basis that oral contraceptives were related to deacresed spontaneous fibrinolysis in the blood, as occurs during pregnancy. The United States Federal Food and Drug Administration established a special committee to investigate the entire problem. This committee, reporting in the *Journal of the American Medical Association,* on September 12, 1963, found in studying 5,798 patients that the incidence of plebitis was 1.55 per 1000 and of pulmonary embolism 0.34 per 1000, among "Enovid" users. In the year 1962, for which reporting was complete, they found 12 thromboembolic deaths among "Enovid" users. In comparing this mortality for pulmonary embolism to that of the general population, the "Enovid" rate is 12.1 per million as opposed to 8.4 per million. This does not represent a statistically significant difference and the committee concluded that there is no increased risk of fatal thromboembolic disease with "Enovid" over that in the general population. They added, however, that "there is a need for comprehensive and critical studies regarding the possible effects of "Enovid" on the coagulation balance and related production of thromboembolic conditions. Pending the development of such conclusive data and on the basis of present experience, this relationship should be regarded as neither established nor excluded." The physician should consider two other points in evaluating this question. First, pregnancy is associated with increased blood coagulability and thus increases the risk of thromboembolic disease over that of the non-pregnant state. Second, unwanted pregnancies drive over 0.5 million expectant mothers to criminal abortion in the United States each year. The mortality and morbidity associated with criminal abortion is alarming in proportion.

There is at present no evidence that oral contraceptives cause foetal masculinization, although there is the theoretical hazard that such may occur should they be used during the early stages of an unrecognized pregnancy. Grumbach, reporting on a case of foetal masculinization, coincident with the use of an oral contraceptive, in *Clinical Endocrinology* in 1959, concluded that this was an accidental occurrence, in no way related to the pills.

There is no evidence that the oral contraceptives cause uterine leiomyomas. Changes in bromsulphalein retention have been reported but this occurs with other steroid hormones and is not associated with any clinical effects. Recently, a few instances of aggravation or precipitation of diabetes mellitus in association with use of the drug have been reported. There have also been reports of mental depression associated with the pills.

Finally, we must discuss the as yet unanswerable question revolving about the possible long-term effects of the drugs. The oral contraceptives are the first instance of large-scale hormonal therapy in healthy individuals. Hormonal therapy tends to frighten both physicians and patients, for one is tampering with the delicate chemical control mechanisms of the body. Oral contraceptives have now been in clinical use for over 8 years and in some cases continuously in the same patient for 8 years. As of yet, no detrimental effects which can be linked to the drugs have been found. Any histological changes in the endometrium are reversible on cessation of therapy. Extensive cytological studies have been incorporated into many of the clinical trials using the Papanicoloau technique and no pathological changes have been found. However, in accordance with the U.S. Federal Food and Drug regulations on new drugs, the oral contraceptives are recommended for use for a maximum of 48 months only, until continuing studies indicate that the present lack of undesired effects persists.

Recent reports appearing in the professional literature and the press linking an increased incidence of genital tract tumors in certain strains of mice, to the administration of excessive doses of oestrogen, have rekindled a lingering fear that the oral contraceptives might be associated with an increased possibility of developing genital tract cancer. Two facts weigh against these reports. The strains of mice used are predisposed to develop, at some time, genital tract cancer and the oestrogen dosages used are far greater than in contraceptive therapy. Yet, the oestrogen doses in therapy are greater than normal physiological amounts and it is well known that many cancers involving the genital system in both sexes are often hormone dependent. For example, carcinoma of the breast is known to be oestrogen dependent in 50% of cases. Also, excess hormonal stimulation may be a factor in initiating cancer in a target organ. It is known, for example, that the oestrogen-producing ovarian tumours such as the thecal cell tumor and the granulosa cell tumor predispose to an increased incidence of carcinoma of the endometrium. The endocrinologist Greenblatt believes that, "hormones may modify, may stimulate, may induce regressive changes by changing the hormonal milieu in which neoplastic cells exist" but *he doubts,* "whether the hormones themselves per se, initiate cancer." Obviously this entire question is still an open one and worthy of much further investigation. Everyone is in agreement, however, that breast or genital tract cancer should be ruled out before oestrogen-progestin therapy is initiated.

Many physicians have been concerned about the possible long-term effects of the drugs on future pregnancies. Cook, reporting in the *American Journal of Obstetrics and Gynaecology*, in 1961, states that there is no evidence of increased abnormalities in children born after therapy or of increased complications during pregnancy or delivery. Others have hypothesized that these drugs may, as a result of fewer ova being used, delay the menopause and prolong fertility into the seventh decade of life. However, grand multiparous patients who use few ova during their reproductive life do not have a postponement in their menopause or a prolongation of their fertility.

In summary, the commoner side effects of the oral contraceptives are minor and with the newer preparations are becoming less frequent. The unpredictable side effects are rare and in no instance has a direct causal relationship with the contraceptive pills been established. Regarding possible long-term effects, one can not say anything with assurance yet.

There are, however, certain situations which should be considered as contraindications to the use of the oral contraceptives in the present state of our knowledge.

1. The actual presence or a history of thromboembolic disease in the patient.

2. The presence or a history of cancer of the breast or genital tract.

3. Nursing mothers, in whom the oestrogens inhibit lactation.

4. Girls who have not yet achieved physical maturity, for the oestrogens stimulate premature closure of bone epiphyses.

Paramedical Considerations

The July 6, 1964 issue of *Newsweek* contained an excellent article entitled "Birth Control: The Pill and the Church" which summarized the great religious controversy surrounding oral contraceptives. The following is a quotation from Pope Paul VI, on June 23, 1964, concerning oral contraception.

"The question is being subjected to study, as wide and profound as possible, as grave and honest as it must be on a subject of such importance— We will therefore soon give the conclusions of it in the form which will be considered most adapted to the subject and to the aim to be achieved."

Pope Pius XII had ruled in 1958 that the oral contraceptives could be used on a doctor's prescription to treat reproductive disorders; used as a contraceptive, however, they were morally unacceptable. However, as the pronouncement of Pope Paul indicates, there are signs of change in the Catholic Church concerning this question. Surveys of Catholic homes in the United Sates have shown that 3 out of 5 families wish a relaxation in the rules and 70% of U.S. Catholics use some method other than the rhythm method for contraception.

Dr. John Rock, Clinical Professor of Gynaecology, Emeritus, at Harvard Medical School, and co-developer of the pill, is a devout Catholic, who has for obvious reasons been greatly concerned with the whole religious question. In his recently published book, *The Time Has Come: A Catholic Doctor's Proposals to End the Battle Over Birth Control,* he considers the pill to be morally acceptable because it imitates the body's own natural endocrinal chemsitry. "The pill is the first physiologic method of contraception and it preserves the integrity of the sex act."

Conclusion

The oral contraceptives represent a therapeutic advance in medicine comparable in magnitude to the discovery of antibiotics. At present they are the best means of contraception available. It is very unlikely, however, that they represent the final answer. The fact that the oral contraceptives are now used by millions of women without untoward effects is testimony of their inherent safety. Regarding the various preparations available on the market, there is little but personal preference to choose among them. The ultimate decision to prescribe these drugs, as in all prescribing, rests with the individual physician, who should realize that our knowledge concerning them is far from complete.

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Artificial Insemination

MEL ROBERTS, '65

Definition

Artificial insemination may be defined as the injection of semen into the female reproductive tract by means of a syringe in order to produce fertilization of the ovum. It may be with the semen of an anonymous donor (Artificial Insemination Donor or A I D) or with semen from the the woman's husband, (Artificial Insemination Husband or A I H). We will include A I H in our definition as is done in most of the literature; many gynaecologists feel this is not a form of artificial insemination.

History

Artificial Insemination has a relatively short history. It was only first successfully done in humans as late as 1785 by John Hunter. According to legend, artificial insemination was used by the Arabs to breed horses as early as the fourteenth century. In Europe, Swammerdam of Holland reported the first unsuccessful experiments on the fertilization of lower animals in 1680. In 1785, Spallanzani reported successful artificial insemination of insects, amphibia, and a dog. About the same time John Hunter successfully used A I H to treat a London linen draper and his wife whose marriage had been rendered sterile by severe hypospadias in the husband. Hunter simply injected the husband's semen into the wife's vagina.

Apparently the use of A I H spread gradually. In 1866, Marion Sims reported a series of 55 successful cases which included the first successful case in North America. Sims later condemned artificial insemination as immoral.

The use of artificial insemination in livestock breeding is outside the realm of this article but it is so important it must be mentioned. Its importance has grown steadily since 1907 when Ivanoff, a Russian physiologist, published an article on "artificial insemination in several subprimate animals." By using artificial insemination, the semen from a superior sire may be diluted, frozen for storage, and used to inseminate hundreds of females. Obviously it is more economical to keep one sire than several. There is also more efficient use of superior sires, less spread of disease, and many other technical advantages of artificial insemination.

Artificial insemination from donors in humans (A I D) has developed entirely in the twentieth century. However, it has not been well accepted by the general population and it has met strong religious opposition. Guttmacher estimates 5000 to 7000 births per year in the United States are the results of artificial insemination.

Indications for Artificial Insemination

These indications, and more especially the contraindications, for artificial insemination must be very carefully adhered to. The physician must know the couple very well and they must be ideally suitable for artificial insemination in every way. No matter how much the treatment is minimized, it may cause a great deal of psychological trauma to the couple and their marriage, both at the time of insemination and thoughout their future married life. This is especially true of A I D.

(1) **Indications for A I H**

The following indications and contraindications are those of L. H. Levie as published in the International Journal of Fertility, Jan.-Mar. 1962.

Indications for A I H

(a) Psychosomatic infertility where the semen of the husband is good but natural coitus does not occur, or where casual psychotherapy is either impossible, has to be deferred because of the age of the wife (i.e. she is approaching menopause) or tensions caused by delay in pregnancy will lead to unsatisfactory psychotherapy.

(b) Organic infertility where natural coitus occurs but the semen is of low quality or quantity.

Contraindications of A I H

(a) Where A I H will cause conflicts with the emotional or psychological (religious) nature.

(b) Where the interests of the child will not be sufficently secured because of (1) instability of the mariage, (2) poor educative capacities of one or both parents, (3) high risk of inherited defects.

(c) Where the woman is a poor medical risk for pregnancy.

(d) Where psychotherapy or other medical treatment may be successful treatment of infertility.

In cases of functional infertility, having a child has become such an obsession with the parents that normal intercourse does not take place. If the physician promises to help, he often removes this emotional factor and normal fertilization takes place before treatment itself is started. Frequently a couple will have one child by A I H and then more children by normal intercourse. In these cases psychotherapy should always be tried first unless the wife is approaching menopause and there is not time for prolonged psychotherapy.

The other important indication is organic infertility. Oligospermia is probably the main cause. If there are less than 10 million sperm per cc then A I H is virtually hopeless. If the couple request AID

and they are acceptable candidates, then AIH may be used first to satisfy them that AIH is hopeless. Medical treatment of oligopermia with thyroid extract, gonadotrophins, testosterone, vitamins, etc. is probably seldom successful but may be tried first. Then AIH is tried before considering AID.

The contraindications of AIH may be summarized as the "possibility of organic or psychological damage to one or both parents or the child." An unstable husband may not be able to accept the child because it is a constant reminder of his masculine inadequacy. Of course, all contraindications to a couple having children must be considered.

(2) **Indications for A I D**

These fall into two categories (a) the husband is permanently sterile, or (b) the husband carries a genetic factor that would be lethal to the child.

In the first category we are faced with the problem of proving permanent sterility. If the husband is oligospermic AIH should be tried. However, if the sperm count is under 10 million per cc even after medical treatment (vitamins, testosterone, etc.) AIH is virtually hopeless and AID should be tried, especially if the wife's age is nearing menopause.

The second indication is where the husband carries a genetic factor that is lethal to the child. The Rh factor is an indication if the wife has become highly sensitized and has had several hydropic infants. Amaurotic familial idiocy and Huntingdon's chorea may also be avoided by AID.

The contraindications to AID are similar to those for AIH but are much more exacting. Both the parents must be emphatic in their desire for a child by AID; they must be very well balanced mentally and their marriage must be pefectly sound. An unstable husband will likely not accept the child and may even become hostile if he sees it as a threat to his ego. If the wife is obsessed with the idea of having a child he may later reject her husband completely. In summary AID, like AIH, is contraindicated where there is a possibility of organic or psychological damage to one or both parents, or the child or the marriage.

Procedure

The procedure for AIH and AID are very similar except in the collection of semen and in the handling of the patient. There are a few other minor differences so the procedures for both will be treated separately.

Procedure of A I H

This may be done by the physician or the woman herself. In both cases it is important to carefully collect the semen and inseminate the woman at the correct time.

Semen should be collected in a clean, dry, slightly warmed glass container by masturbation of the husband. Coitus interruptus may also be used; using a washed condom is a poor third choice of collection. The means of collecting the specimen often discourages couples who are not really sincere in their desire for a child. If the semen is of good quality it can be used up to two hours after collection.

The timing of the insemination is a problem of estimating the time of ovulation. This is relatively easy if the woman's periods are regular but otherwise it is often difficult. The change in basal body temperature does not occur until after ovulation and is therefore useless. Daily examination of vaginal smears and testing of the cervical mucous for glucose is complicated. Even with irregular periods the calendar seems to be the best method.

(a) Self Insemination

In this procedure the wife uses a suitable syringe to inject a specimen of the husband's semen into the vagina. This procedure has a poor success rate but prepares the patient for A I H by the physician.

(b) A I H by Physician

There are several procedures used that differ only in the site of injection of the semen. Many practitioners keep the patient lying down afterward to facilitate sperm migration but this likely has no effect.

(1) Intravaginal Insemination:
The semen is simply placed in the vagina with a syringe.

(2) Paracervical Insemination:
In this procedure the semen is applied to the cervix and may be kept in place with a cervical cup.

(3) Intracervical Insemination:
The semen is injected into the cervical canal by canula. Only a small amount remains here and the rest drains back into the vagina.

(4) Intrauterine Insemination:
This may be used in cervical disorders. The procedure is difficult and no more than 0.25 to 0.5 cc of semen can be used without producing severe painful uterine contractions and risking infection.

Procedure of A I D

A I D is probably one of the most psychologically delicate procedures in medicine and its legal status and the legal status of the offspring is often very uncertain. Therefore, there are certain principles that must be followed to minimize emotional trauma and give the child the same emotional and legal status as a child from natural conception. The following is an abbreviation of rules laid down by Guttmacher in 1943.

(1) The donor must be completely anonymous to the recipient and her husband and the recipient and her husband anonymous to the donor.

(2) Before considering A I D, know the couple, know their intellectual capacity, emotional stability and marital stability.

(3) If either the husband or the wife is unenthusiastic about using A I D, do not use it.

(4) Use no signed papers at all so that the magnitude of the procedure will be minimized in the minds of the parents. It is thereby hoped to minimize the psychological trauma of A I D and make the couple's attitude simulate that of "natural" parents.

(5) In hospital records and birth certificates identify the husband as the father.

(6) Keep fees small to minimize the apparent importance of the procedure.

The donor must be as much like the husband as possible (i.e. eye colour, hair colour, height, body build, etc.). If his blood group is the same it may avoid future legal problems related to paternity. However, "hidden" factors like this can be ignored. Religion and nationality can be ignored if they do not affect the physical characteristics. The donor must also be investigated for venereal disease and sperm count. The donor must have a sperm count of at least 100 million per cc. with at least 80% motility and less than 20% abnormal forms and a volume of 2.5 to 5 cc. per ejaculation.

The procedure is much the same as for A I H. The donor washes thoroughly, obtains a specimen in a clean dry bottle and the specimen is taken to the physician

within an hour. Of course precautions are taken to prevent the donor from meeting the recipient couple. The techniques of insemination are similar to those of A I H.

(1) Vaginal insemination:
Same as for A I H.

(2) Paracervical insemination:
The cervix is exposed and the os is bathed several times with small amounts of semen. The cervix may also be bathed in the semen by putting the semen in a plastic cup which is closely applied to the cervix.

(3) Intrauterine insemination:
As with A I H, this method will cause severe painful contractions and a risk of infection if over 0.25 to 0.5 cc. are used.

Stored frozen semen (stored at −70°C) has been used without ill effects after 6 weeks but it is rarely used in practice.

Prognosis of Artificial Insemination

The success rate of A I H is not particularly impressive and figures vary widely in different series. Only about 3% conceive with the first insemination and about 50% conceive with 12 or more inseminations at two inseminations per cycle. There were no statistics available to indicate psychiatric prognosis in A I H.

The success of A I D is much better than A I H and there is more information available. In a series of 690 cases treated by several physicians the overall conception rate was 60% with success rates for various physicians being 55% to 78%. Of the successful cases, 37% became pregnant in one month of treatment, 75% in two months' treatment. The success rate seems to depend on the skill of the physician and in on series by Guttmacher there was an 80% conception rate after two months' treatment. If pregnancy does not occur in three months then therapy should be discontinued for six months on the theory that there is fluctuation in fertility.

The obstetrical prognosis of A I D is not grossly abnormal. There seems to be a high incidence of spontaneous abortion but this is likely because pregnancy is diagnosed earlier than after normal conception.

If patients are well chosen the psychiatric prognosis should be excellent. In spite of careful selection very few women have required psychiatric treatment after A I D.

Religious Aspects of Artificial Insemination

The only specific statements on artificial insemination by a church come from the Anglican and Roman Catholic churches. Both condemn A I D, the Roman Catholic Church also condemns A I H. Other Christian churches have no policy with regard to artificial insemination. Jewish opinion is divided because of different interpretations of the word "adultery".

In 1945 the Anglican Church in England set up a commission to study the question. A I H was quite acceptable to the commission. However, with the exception of one member, the commission condemned A I D as adultery in effect and inconsistent with the nature of marriage, and they even suggested A I D be made a criminal offence. Subsequently the Archbishop of Canterbury called A I D "wrong in principle and contrary to Christian standards".

The Roman Catholic Church has made several statements on the subject of artificial insemination since it first condemned the practice in 1847. In 1949, Pope Pius

XII condemned it as "entirely illicit and immoral unless it serves as an auxiliary to the natural act of union of spouses." Only the spouses have mutual rights of procreation over their bodies and these rights are not transferable.

In 1948, one theologian explained the stand of the Roman Catholic Church in the following way. A I D amounts to adultery and is, therefore, sinful. A I H is forbidden if it requires masturbation by the husband (which according to the church is itself sinful and no good end may be served by sinful means). A I H may only be used following normal sexual intercourse. Some theologians permit collection of semen in a condom which has a tiny hole to satisfy beliefs against contraception. Others reject this and say the semen may only be obtained from the wife's vagina following normal sexual intercourse. It has even been suggested the semen may be obtained from the testicles by needle aspiration.

It is important to know what the patient's church allows. If a patient receives a treatment contrary to his church's law he or she may later become remorseful and may even require psychiatric treatment. Artificial insemination has enough emotional trauma without adding what the patient may later consider an unpardonable sin.

Legal Aspects of Artificial Insemination

Because of the relatively short history of artificial insemination it is covered by very few statutes and legal precedents. The problems are mainly related to legitimacy, paternity, adultery and the definition of these terms.

A I H has few legal problems because the husband is definitely the father. However, in A I D the donor is biologically the father and this is the source of the legal difficulties. Is the child legitimate? Is the child the heir of the donor or the husband? If the couple have a child later by natural conception, what are the inheritance rights of the child conceived by A I D? Is the donor liable for maintenance of the child? Can the husband obtain a divorce on grounds of adultery through A I D?

These problems can be avoided by following the principles given under "procedure". Some physicians mix some of the husband's semen with that of the donor so there is always the possibility the husband may, in fact, be the father. Some physicians match the donor's and the husband's blood groups so illegitimacy cannot be proven on this basis. The best methods are to obtain the full consent of the husband, carry out the procedure in complete secrecy, and keep no record of the procedure. These precautions may seem too elaborate but legal problems have accurred in many countries, including Canada.

Conclusion:

Artificial insemination either by donor or husband is the ultimate treatment of infertility of the husband. Unfortunately, popular feelings have been aroused against the procedure and this produces much of the emotional trauma to the individual couple. However, if husband and wife are emotionally stable and have a stable marriage, they may be considered for A I H and if they are excellent candidates for A I D. In these circumstances artificial insemination has a great deal of happiness to offer the couple.

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Letters From Alumni

1919—Dr. L. W. Pritchett, who in the Alumni Issue was reported to be deceased, introduced himself to several of the Journal staff at Homecoming Weekend. It is with red faces that we happily correct our error.

1936—Dr. Harold O. Smith is now residing at 3769 Sunset Drive, Flint 3, Michigan. He is a specialist in Orthopaedic Surgery and in 1962 he spent the month of June in Enugu, Nigeria for Medico. He has written two papers on this experience, "Orthopaedic Surgery in Nigeria" which appeared in Clinical Orthopaedics and "An Orthopaedic Safari" in the Journal of the Michigan State Medical Society.

1949—Dr. D. G. Sim, of 452 Main Street E., Hamilton would like to know the whereabouts of Dr. Wm. "Bert" Cross also of Meds '49 who was last known to be in Bracebridge, Ontario.

Dr. Gordon Campbell, 10510 Chapman Avenue, Suite 6, Gurden Grove, California. After interning at Metropolitan General Hospital, Windsor, Dr. Campbell spent two years in general practice in Windsor with Dr. Alan Taylor, following which he was a resident in Obstetrics and Gynecology at the City of Detroit Receiving and Herman Kiefer Hospitals. In 1956, he became Assistant Professor of Obtetrics and Gynecology at Wayne State University and he held this post until 1960, with the exception of two years spent in Shiraz, Iran as an Assistant Surgeon in charge of the Department of Obstetrics and Gynecology in Nemazee Hospital. Since 1960, he has been in private practice in California.

1951—Dr. Foreman of 1538 Sherbrooke Street, W., Montreal is a Lecturer in Ophthalmic Pathology at McGill.

Dr. A. S. Norris resides at 5425 S. W. Burton Drive, Portland, Oregon. He presently is Associate Professor of Psychiatry at the University of Oregon Medical School and before this was Associate Professor of Psychiatry at Iowa State University. He is interested in capillary morphology and its role in mental illness. In 1964, he was elected a Fellow in the American Psychiatric Association.

1959—These three alumni were omitted from the list in the Alumni Issue.

Dr. Paul D. White, 282 Westcourt Place, Waterloo, Ontario interned at Montreal General Hospital. From 1960 on he was at St. Joseph's Hospital, London, Ontario. In 1961 he went to the Kresge Eye Instiute, Detroit. He is married and has one son.

Dr. Doreen Young, 24 Presteign Avenue, Toronto 16, interned at Toronto East General Hospital. She is now in practice in East Toronto.

Dr. Ernest Zarzour, c/o Harper Hospital, 3825 Brush Avenue, Detroit, Michigan, interned at Henry Ford Hospital in Detroit.